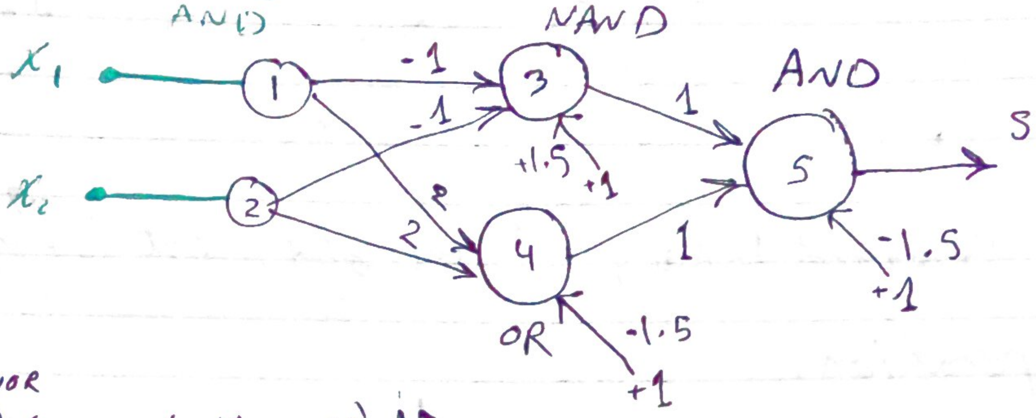
سكشن [2] .. م.محمد 8/10/2016

[16] $(x_1 x_2)'(x_1 + x_2) = x_1 \oplus x_2$

NAND, OR → AND

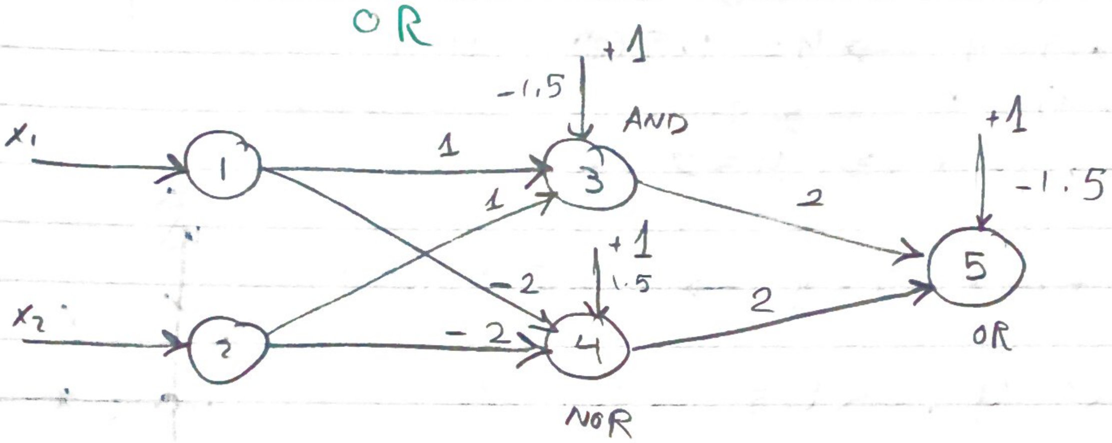


XNOR

$x_1 \odot x_2 = x_1 x_2 + x_1' x_2'$

$= x_1 x_2 + (x_1 + x_2)'$

AND, NOR → OR

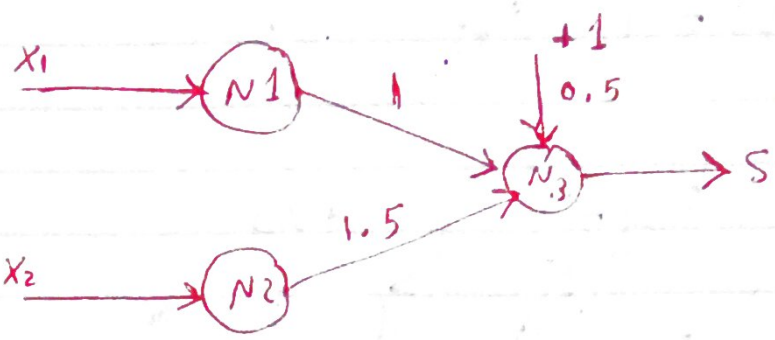


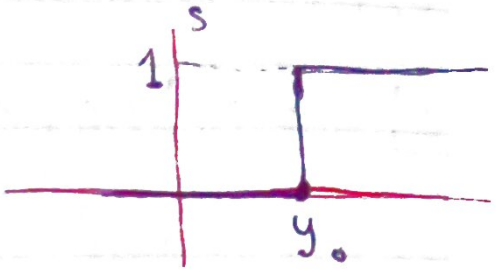
الحل يكون بالخطوات مفصلة ، راجع سكشن 1 و محاضرة 2 للخطوات

⟹

* Shifted threshold :-

a)





Using shifted binary threshold, satisfy OR operation :-

$$y = x_1 + 1.5 x_2 + 0.5$$

x_2	x_1	S
0	0	0
0	1	1
1	0	1
1	1	1

① $x_1 = x_2 = 0 \longrightarrow S = 0$

$y = 0.5$ ①

② $x_1 = 1, x_2 = 0 \longrightarrow S = 1$

$1 + 0.5 = y \Longrightarrow y = 1.5$ ②

③ $x_1 = 0, x_2 = 1 \longrightarrow S = 1$

$1.5 + 0.5 = y \Rightarrow y = 2$ ③

④ $x_1 = x_2 = 1$

$1.5 + 1 + 0.5 = y \Rightarrow y = 2.5$ ④

$0.5 < y_0 < 1.5$

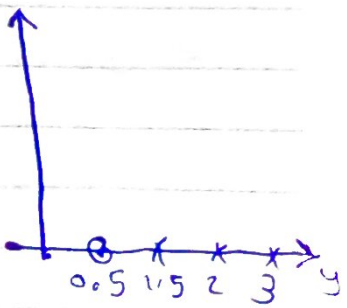
$y_0 = 1$ (arbitrary)

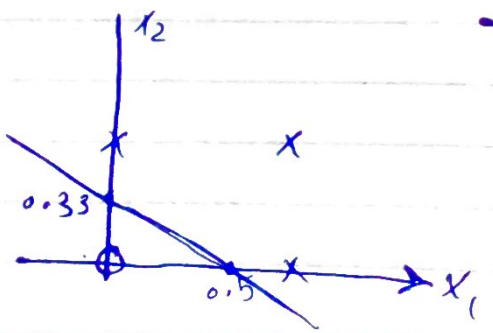
$y = x_1 + 1.5 x_2 + 0.5$

$1 = x_1 + 1.5 x_2 + 0.5$

$x_1 = 0 \Longrightarrow x_2 = 0.33$

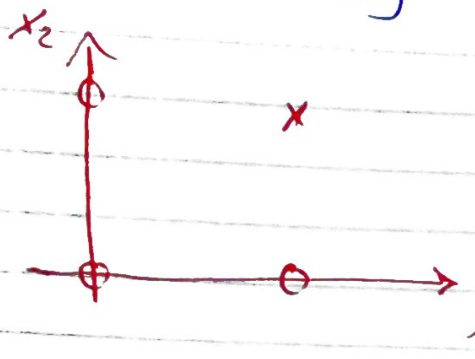
$x_2 = 0 \longrightarrow x_1 = 0.5$

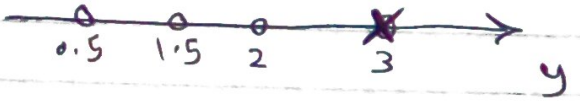




for AND ; follow the same steps with the following TT

x_2	x_1	S
0	0	0
0	1	0
1	0	0
1	1	1





$2 < y_0 < 3$

Let $y_0 = 2.5$

$2.5 = x_1 + 1.5x_2 + 0.5$

$x_1 = 0 \longrightarrow x_2 = 1.33$

$x_2 = 0 \longrightarrow x_1 = 2$